

Name: ANSWER KEY Date: \_\_\_\_\_ Period: \_\_\_\_\_

## Unit 1 Practice Test

**Variables and Translations.** Write an algebraic expression for each phrase.

a. the sum of 5 and three times a number  $5 + 3n$

b. 8 minus the product of 9 and a number  $8 - 9n$

**Define variables and write an equation to model the following situation.**

a. The total cost of gas is the number of gallons times \$3.79.

Let  $C$  = total cost

Let  $g$  = number of gallons

$$C = 3.79g$$

b. The perimeter of a regular octagon is 8 times the length of one side.

Let  $p$  = perimeter

Let  $s$  = length of a side

$$P = 8s$$

**rGEMDAS.** Simplify the following expressions.

$$2[(13 - 7)^2 + 3]$$

$$2[(6)^2 + 3]$$

$$2[36 + 3]$$

$$2[12]$$

$$24$$

$$12 + 3[18 - 5(16 - 13)]$$

$$12 + 3[18 - 5(3)]$$

$$12 + 3[18 - 15]$$

$$12 + 3[3]$$

$$12 + 9$$

$$21$$

$$36 - (4 + 5 \cdot 4)$$

$$36 - (4 + 20)$$

$$36 - 24$$

$$12$$

$$9 + [4 - (10 - 9)^2]^3$$

$$9 + [4 - (1)^2]^3$$

$$9 + [4 - 1]^3$$

$$9 + [3]^3$$

$$9 + 27$$

$$36$$

**Evaluate Expressions.** Evaluate each expression. Use  $a = 3$   $b = -2$   $c = 1$

$$2a^2 - (4b + c)$$

$$2 \cdot 3^2 - [4(-2) + 1]$$

$$2 \cdot 3^2 - [-8 + 1]$$

$$2 \cdot 3^2 - (-7)$$

$$2 \cdot 9 - (-7)$$

$$18 - (-7) = \boxed{25}$$

$$9(a + 2b) + c$$

$$9(3 + 2 \cdot (-2)) + 1$$

$$9[3 - 4] + 1$$

$$9[-1] + 1$$

$$-9 + 1$$

$$\boxed{-8}$$

$$4a - b^2$$

$$4 \cdot 3 - (-2)^2$$

$$4 \cdot 3 - 4$$

$$12 - 4$$

$$\boxed{8}$$

$$\frac{2a + b}{2}$$

$$2$$

$$\frac{2 \cdot 3 + (-2)}{2}$$

$$2$$

$$\frac{(6 + (-2))}{2} = \frac{4}{2} = \boxed{2}$$

**Operations with Integers.** Simplify.

$$|-9| = \underline{9}$$

$$5 + |5 - 9| = \underline{9}$$

$$5|6 - 7| + 6 = \underline{11}$$

**Distributive Property.** Simplify. Use the distributive property in reverse.

$$-4(2x + 6)$$

$$\boxed{-8x - 24}$$

$$15x + 3 = \underline{3(5x + 1)}$$

$$27x - 9 = \underline{9(3x - 1)}$$

$$8 - (4x + 3) - 10x + 6$$

$$8 - 4x - 3 - 10x + 6$$

$$\boxed{-14x + 11}$$

**Properties of Numbers.** Simplify the expression. Justify each step.

$3(2x - 4) + 2x$	Expression
$6x - 12 + 2x$	Distributive Property
$6x + 2x - 12$	Commutative Property of +
$(6 + 2)x - 12$	Distributive Property
$8x - 12$	Addition

Subtraction

What are the four properties that allow us to solve equations?

Identity Property of multiplication

Identity Property of Addition

Inverse Property of multiplication

Inverse Property of addition

**Real Numbers.** Name the set of numbers to which each number belongs. You can just use the first letter.

Rational

Irrational

Whole

Integer

-3.21

R

$-\frac{1}{2}$

R

18

W, I, R

$\sqrt{7}$

Ir

Describe the difference between irrational and rational numbers. Must be at least THREE SENTENCES.

Include:

• non-terminating decimals

• non-perfect square roots

•  $\pi$

• non-repeating decimals

similar  $\rightarrow$  all real numbers